

CONSTRUCTION STRUCTURES AND MANUFACTURING PROCESSES FOR INTEGRATED CIRCUIT WAFER PROBE CARD ASSEMBLIES

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ABSTRACT

Several embodiments of integrated circuit probe card assemblies are disclosed, which extend the mechanical compliance of both MEMS and thin-film fabricated probes, such that these types of spring probe structures can be used to test one or
10 more integrated circuits on a semiconductor wafer. Several embodiments of probe card assemblies, which provide tight signal pad pitch compliance and/or enable high levels of parallel testing in commercial wafer probing equipment, are disclosed. In some preferred embodiments, the probe card assembly structures include separable standard components, which reduce assembly manufacturing
15 cost and manufacturing time. These structures and assemblies enable high speed testing in wafer form. The probes also have built in mechanical protection for both the integrated circuits and the MEMS or thin film fabricated spring tips and probe layout structures on substrates. Interleaved spring probe tip designs are defined which allow multiple probe contacts on very small integrated circuit pads. The
20 shapes of probe tips are preferably defined to control the depth of probe tip penetration between a probe spring and a pad or trace on an integrated circuit device. Improved protective coating techniques for spring probes are also disclosed, offering increased reliability and extended useful service lives for probe card assemblies.